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ABSTRACT

This paper examines the incentive structures in rural communities that encourage or discourage the accumulation of human capital. This is done by identifying the factors that influence educational performance in four school districts in rural Appalachian Virginia and Kentucky. A review of human capital theory, models, and functions generated six hypotheses concerning the relationships of youth valuation of education to parent attitudes, perceived availability of local employment opportunities, willingness to migrate, educational performance, and educational and occupational aspirations. Data were derived from student records, surveys of high school seniors and dropouts in 12 high schools, and interviews with their parents. The results suggest that the value that youths place on education is influenced by local job opportunities and, to a lesser extent, by willingness to leave the local community to find employment, parents' valuation of education, and family socioeconomic conditions. The results also show that youth valuation of education and socioeconomic background influence educational performance and educational and occupational aspirations. Implications for rural community development are discussed. Contains 25 references. (SV)

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Community and Family Influences on Educational Performance in Appalachian Communities

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Community and Family Influences on Educational Performance in Appalachian Communities

by

David Broomhall
and
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In 1967, the President's National Advisory Commission on Rural Poverty published a report entitled *The People Left Behind*. The report focussed national attention on the problems of rural America: poverty, unemployment, low quality housing, inadequate health care, and institutions that have failed to meet the needs of the people. The report prompted a widespread effort to increase the well-being of rural America and to eradicate poverty. In many communities these efforts caused a notable improvement in the quality of education, housing, and the environment. However, many rural communities are still substantially below the national average in virtually all measures of economic and social well-being.

Rural communities have tried, with varying degrees of success, to adapt to changing economic conditions by diversifying into manufacturing and other industries, and as destinations for retirees and recreation. Successful transformation from dependence on traditional rural industries (agriculture, forestry, mining, and fishing) to other economic activities requires that the available labor have the ability to adapt to changing conditions. In communities in which the labor force is unwilling or unable to adapt to change there is a greater likelihood that they will encounter a disproportionate share of economic and social problems.

One area that has been particularly hard hit is the coal region of central Appalachia. Various factors have conspired to prevent this region from taking part in the gains in economic prosperity that have occurred nationally. One reason for the lack of growth in central Appalachia is the nature of its work force. Long term under-investment in education has created a work force that is not highly adaptable to other industries. The coal-based economy has historically provided disincentives for young people to invest in education because the returns to this investment have been low or negative (Bluestone, Murphy, and Stevenson, 1973).

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This paper addresses the hypothesis that in many rural communities an incentive structure exists that is not conducive to economic development. For those individuals able and willing to move to more prosperous communities to secure employment, the acquisition of skills necessary to compete successfully in the national labor market is of paramount importance. Since formal education is the primary source of these skills, this hypothesis would predict that those who are more willing to move from their community will have the greatest incentive to perform well in school. Those less willing to leave perceive that the potential returns to investments in education (good paying jobs that require an education) are either too low or too uncertain to justify the sacrifice required. At the same time, the community's investment in the education of its youth is not returned when they migrate to other communities to find jobs. This creates an incentive for the local community to provide a level of support for education below that which is socially optimal. This paper examines the incentive structures in rural communities that encourage, or discourage, the accumulation of human capital. This is done by identifying the factors that influence educational performance. Four school districts in rural Appalachian Virginia and Kentucky provide the setting for examining these issues. The basis of this research is the theory of human capital.

Human Capital Theory

Theodore W. Schultz, the nobel prize winning economist and father of human capital theory refers to human capital investment as being ". . . expenditures on education, health, and internal migration to take advantage of better job opportunities . . ., earnings foregone by mature students attending school and by workers acquiring on-the-job training . . ., [and] the use of leisure time to improve skills and knowledge" (1961, p. 1). By Schultz's definition then, formal education is but one element of a broader set of contributory processes that economists consider as the set of acquired skills and knowledge that an individual may possess. Human capital theory rests on the concept that individuals must choose between current consumption and foregoing current consumption to acquire skills that will increase future income, and thus future consumption. In this research, the only human capital considered is formal education.

Theory suggests that individuals will maximize the present value of their lifetime earnings stream by pursuing education up to the point at which the returns to additional educational are no longer greater than the cost of obtaining the education. The theoretical model for this research is based on a variant of human capital theory presented by Becker (1975). The analysis begins with a two period utility function:

$$(1) \qquad U = U(X_1, X_2, S)$$

where X_1 and X_2 are vectors representing consumption of goods and services in periods 1

and 2, respectively, and S represents the proportion of period 1 devoted to schooling.

This utility function assumes certainty with regard to consumption in both periods. In reality, individuals' decisions and behavior are based on expectations for the future. There is much uncertainty regarding the future since individuals are unsure about employment prospects, the nature of their own abilities and desires, the kind of work they would like to pursue, and the level of wages they might expect in certain occupations. These uncertainties are likely to be particularly evident in young people just beginning their careers. Individuals are also unsure of other factors such as health problems and the state of the economy, which influence the return on investment in human capital.

Expectations can be incorporated into the utility maximization framework by using the expected utility theorem developed by Von Neumann and Morgenstern (1947). Incorporating expectations into economic models requires the identification of future states of the world, and the probability that each of these states of the world will come about. It also requires a set of assumptions about rational behavior in the ranking and choice of the various states of the world. To invoke the expected utility theory it is necessary to assume that the individual can identify the various states of the world and attach associated probabilities. When the states of the world and probabilities are known, the utility of each choice can be evaluated by calculating the expected utility of each outcome. The decision regarding which of these outcomes to choose is a function of the individual's attitude about risk. If all states of the world and their associated probabilities are known with a distribution, F(x), the expected utility function for the individual can be expressed as:

$$(2) \qquad EU(F) = \int U(x)dF(x)$$

where EU is expected utility. By definition (Hey, 1981, p. 21), if $EU(F) \leq U(EF)$ for all F, where E(F) is the expected value of a random variable with distribution F, the individual is said to be risk averse. Likewise, if $EU(F) \geq U(EF)$ for all F the individual is risk loving, and if $EU(F) = U(EF)$ for all F the individual is risk neutral.

To account for the influence of risk aversion and risk loving characteristics, a great deal of information about the utility functions of individuals must be known. Because of these information needs, and because the incorporation of risk significantly complicates the analysis, the explicit treatment of risk aversion is not considered here. Since by definition the expected utility function is equivalent to the utility function with expectations as arguments only under the assumption of risk neutrality, this assumption is maintained throughout this paper. Incorporating the concept of risk neutrality and using the expected utility theorem allows Equation (1) to be rewritten as:

$$(3) \qquad EU = U(X_1, EX_2, S)$$

Another facet of uncertainty exists in that future income and the returns to education are unknown. The individual bases decisions regarding the acquisition of human capital on the expected values of these factors. Under the assumption of risk neutrality, the individual will simply choose X_1, X_2, and S so as to maximize utility if the expected values of future variables are realized. Hence, the individual's income constraint may be written as:

$$(4) \qquad Y_1(1\text{-}S) + EY_2(S)/(1+r) = P_1X_1 + EP_2EX_2/(1+r)$$

where Y_1 is income in period 1, EY_2 is expected income in period 2, P_1 is price in period 1, EP_2 is expected price in period 2, and r is the discount rate. Since S is the proportion of period 1 used for education, 1-S is the proportion spent working and earning an income. Implicit in this model is the restriction that the individual can either work or invest in education in period 1 while the individual can only work in period 2. This model also assumes that education is a free good, except for the opportunity cost of time.

As defined in equation (4), earnings in period 2 are a function of the amount of education obtained in period 1. In rural areas, jobs that require larger amounts of education and that pay relatively higher wages to those who are educated may not be available. Consequently, if an individual expects to earn a return on his or her educational investment it may be necessary to leave the rural community. The cost of relocating may include both the direct cost of moving and the psychic cost of adjusting to a new social, physical, and economic environment. To account for these costs the expression for wages in period 2 can be redefined as:

$$(5) \qquad EY_2(S) = EY_m(S) - EY_c(S)$$

where $EY_2(S)$ is defined as expected net earnings in period 2, $EY_m(S)$ is expected money, or gross earnings in period 2, and $EY_c(S)$ is the expected cost associated with earning EY_m. The incorporation of this expression into equation (2) and formation of the constrained optimization equation yields the expression:

$$(6) \qquad \text{Max } L(X_1,EX_2,S,\lambda) = U(X_1,X_2,S) + \lambda[Y_1(1\text{-}S) + (EY_m(S)\text{-}EY_c(S))/(1+r) - P_1X_1 - EP_2EX_2/(1+r)]$$

with first order conditions:

(7a) $\partial L/\partial X_1 = U_1 - \lambda P_1 = 0$

(7b) $\partial L/\partial EX_2 = U_2 - \lambda EP_2/(1+r) = 0$

(7c) $\partial L/\partial S = U_s - \lambda[Y_1 - (\partial EY_m/\partial S)/(1+r) + (\partial EY_c/\partial S)/(1+r)] = 0$

(7d) $\partial L/\partial \lambda = Y_1(1-S) + (EY_m(S) - EY_c(S))/(1+r) - P_1X_1 - EP_2EX_2/(1+r) = 0$

that show the necessary conditions for utility maximization. These conditions lead to the optimizing conditions:

(8a) $MRS_{X1X2} = P_1(EP_2/(1+r))$

(8b) $MRS_{SX1} = [Y_1 - ((\partial EY_m/\partial S - \partial EY_c/\partial S)(1+r))]/P_1$

(8c) $MRS_{SX2} = [Y_1(1+r) - \partial EY_m/\partial S + \partial EY_c/\partial S]/EP_2$

and the demand function for educational effort:

(9) $S = D(EY_m, EY_c, Y_1, Y_o, P_1, EP_2, r).$

Of particular importance in this analysis is equation (7c), which is the marginality condition for education. Rearranging equation (7c) and dividing by λ yields the expression:

(10) $U_S/\lambda + (\partial EY_m/\partial S)/(1+r) = Y_1 + (\partial EY_c/\partial S)/(1+r),$

where the terms on the left-hand side of the equation are the expected benefits of education: the utility that one gets from being educated, and the marginal change in expected future money income as a function of education. On the right-hand side are the expected costs of education: the opportunity cost of education, and the marginal change in expected cost associated with future income.

A Modified Model of Human Capital Investment in Rural Areas

The model above suggests that a student's decision to stay in school and to perform well in school will be determined by their personal utility function (especially their attitudes toward education and moving), and their perceived opportunities with and without an

education (that is, expected returns). The incorporation of expectations into the human capital model allows for differences in expectations when individuals face the same set of future alternatives. These expectations will depend on the amount and quality of information available, and upon the process by which individuals form their expectations about the future. The process by which individuals form expectations or perceptions of the returns to human capital investment is an important variable in the human capital decision process. Perceptions are developed from information received from a variety of sources including one's family, others in the community, community institutions, schools, and the media.

Human capital decisions also depend on the individual's attitudes. Of particular importance in the human capital investment decision of rural residents are attitudes toward one's community, the willingness to move away from their community, attitudes toward employment in the community's traditional occupation (farming, mining, logging), and attitudes toward education and educated people. This latter attitude must be carefully distinguished from one's perception of the value of education (that is, the anticipated rate of return). The attitude is part of one's utility function while the perception is the product of calculations of future costs and benefits.

These factors are part of a process by which an individual develops a set of values and attitudes (a utility function) that permits an ordering of all possible future outcomes. The individual's perceptions of future wages and occupations combined with observations of economic and social realities dictate an optimal strategy upon which the individual will act with reasonable confidence. These factors can be incorporated into a model of human capital investment for young people in rural communities (Figure 1).

Figure 1 illustrates a two-step process. The upper portion describes the factors that influence the valuation of education, i.e., the utility function, perceptions, and the influence of the family. Attitudes in this model include attitudes about school, about what constitutes a desirable occupation, the willingness to remain in, or move out of, the community, and attitudes regarding the quality of life in the local community. Attitudes of the parents are expected to influence the child's attitudes and the value that the parents place on education. The child's attitudes and the parent's valuation of education, together with community influences and the youth's perception of local employment opportunities, influence the value that the child places on education. Here, community influences refer to the influence of peers and others in the community.

The lower portion of Figure 1 relates those factors that influence educational performance. Community influences in this instance refer to the institutional structure of education in the community that facilitates learning. Personal characteristics refers to such things as gender and mental ability. Previous studies have shown a high correlation between socioeconomic background and various measures of mental ability, including academic performance (Bachman, 1970; Bachman et al., 1969). In the present research, data on mental ability were not available. Consequently, socioeconomic background serves as a

proxy for mental ability, which warrants the arrow from socioeconomic background to educational performance.

A study by Hanson and Ginsburg (1988) used a similar theoretical construct to that used here. Their model included a causal link between individual and family background characteristics and both students' and parents' values and attitudes, and out-of-school behaviors theorized to be related to educational performance. The three measures of out-of-school behavior used in the study were time spent on homework, time spent watching television, and the amount of time spent reading. Hanson and Ginsburg's findings indicate that both parental and student values and attitudes do influence behavior. However, the regression equations were able to explain only from 5.1 to 17.6 percent of the variation for whites and from 1.2 to 12.2 percent for blacks.

The Hanson and Ginsburg study also examined a causal link between the socioeconomic variables, parent and student value measures and behavior variables, and school performance. The study used scores on standardized reading and math tests, and grade point average as measures of school performance. These models were able to explain from 27.8 to 31.4 percent of the variation in academic achievement. In addition, all three groups of variables--socioeconomic characteristics, parents' and students' values, and students' behavior--were all significant in contributing to the variation in achievement. Moreover, the results indicate that the values variables explain more of the variation in achievement than do the socioeconomic variables.

From the concepts offered by the human capital theory and the model of educational performance four empirically testable equations are derived:

(11) $V_y = f(S,C,M,V_p,A_y,E_y)$

(12) $G_y = f(C,M,V_y)$

(13) $H_y = f(C,M,V_y)$

(14) $O_y = f(C,M,V_y)$

where:

V = valuation of education
S = socioeconomic background
C = community influences
A = attitude
E = employment expectations
M = personal characteristics

G = educational performance
H = educational aspirations
O = occupational aspirations
p = parent
y = youth (or daughter/son)

These four equations are used to test six hypotheses that are embodied in one central hypothesis about the dynamics of education and job creation in rural communities. Many rural communities exhibit low levels of educational achievement, which implies a less productive, lower paid local work force. The predominance of low-wage jobs tends to lower the quality of life in the community. Those individuals who acquire marketable skills are inclined to leave the community in search of economic opportunity elsewhere. Those who intend to remain perceive that the returns to education are low, and hence have little incentive to invest in education. These factors foster lower ambitions to obtain education, which leads to low educational achievement. The six hypotheses that flow from this general hypothesis are:

- Those youths whose parents place a higher value on education will themselves place a higher value on education than those youths whose parents place a lower value on education.

- The perceived availability of local employment opportunities will influence the value that youths place on education.

- Those youths who are more willing to move will place a higher value on education than those who are less willing to move.

- Those youths who place a higher value on education will exhibit higher educational performance than those who place a lower value on education.

- Those youths who place a higher value on education will have higher educational aspirations than those who place a lower value on education.

- Those youths who place a higher value on education will have higher occupational aspirations than those who place a lower value on education.

The first three hypotheses are tested in equation (11), while the fourth hypothesis is tested using equation (12). The last two hypotheses are not drawn directly from the theoretical model presented above. Rather, they are inspired by similar studies that have shown aspirations as an outcome of the educational process (Sewell and Hauser, 1975; Bachman, O'Malley, and Johnston, 1978). Aspirations in this research are of two types: educational

and occupational. Educational aspirations refer to post-high school plans regarding future education or training. Occupational aspirations refers to the type of job one expects to have later in life (at age 35). Equations (13) and (14) are used to test the fourth and fifth hypotheses, respectively.

Data

Four school districts in rural central Appalachia served as the study area. The school districts, which in all instances are divided on county or city boundaries, were chosen to include communities with varying economic and employment characteristics within the central Appalachian region. These communities provide an ideal cross-section from which a case study can be undertaken. The economy of Montgomery County, Kentucky (1986 population of 20,600) is based heavily on manufacturing that offers primarily low-skill employment opportunities. Wise County (1986 population of 44,800) and the city of Norton (1986 population of 4,700), which has its own independent school district, are both located in far southwest Virginia. The economies of both jurisdictions are based primarily on coal mining, which provides over 4,000 jobs directly, and many more in related industries such as heavy equipment, explosives, and mine services. Montgomery County, Virginia (1986 population of 66,100) is located approximately 100 miles east of Wise County. The county features a local economy based on higher education (Virginia Polytechnic Institute and State University (popularly known as Virginia Tech), 1,800 faculty, 22,000 students) and diversified manufacturing and services. Employment opportunities range from low-skill textile manufacturers to high-skill employment in a number of "high tech" businesses, many of which have close ties to Virginia Tech.

The data used in the analysis were derived from student records and surveys of high school aged youth who, with normal progress, would have graduated in June 1990. This population includes high school seniors and dropouts at each of twelve high schools. At each of the 12 high schools the student surveys were administered during school hours to groups of students in classrooms, the auditorium, or other large room in May and June 1990. The dropouts were surveyed by telephone in January 1991. In addition, one parent of each youth was interviewed by telephone. The parents of the students were interviewed in June and July 1990, while the parents of the dropouts were interviewed in January 1991. Usable surveys were obtained from 744 high school seniors, which represents approximately 50 percent of the eligible student population in the study areas. Seventy-five percent, or 560 of the parents of students who provided usable surveys were interviewed. Difficulty in locating the dropouts contributed to a low response rate of approximately 34 percent, which includes 75 matching pairs of dropout-parent surveys.

Slight differences in wording exist between the surveys of the dropouts and those of the students, which reflect differing circumstances among the two groups. In addition, the

students responded to a number of statements on a five-point scale (strongly agree, tend to agree, neither agree nor disagree, tend to disagree, and strongly disagree), while the parents and dropouts responded on a four-point scale with slightly different wording (strongly agree, somewhat agree, somewhat disagree, and strongly disagree). To coordinate the responses of the dropouts and parents with the students, the four-point scale was transformed to a five-point scale by incrementing the "somewhat disagree" and "strongly disagree" categories by one unit, which effectively omits the "neither agree nor disagree" category on the parent and dropout surveys.

This series of surveys provided data for the following variables: socioeconomic background; personal characteristics; perceptions of local employment opportunities; community influences; personal attitudes; the value placed on education; and educational and occupational aspirations. Measures of educational performance were obtained from school records. Each of these are discussed below.

Socioeconomic Background and Personal Characteristics. Measures of socioeconomic background used in this research include household income, parent's occupation, parent's education, and household structure. The income of the parent's household (INCOME) is defined by eight discreet income groups for incomes lower than $50,000. The six lowest groups were defined in $5,000 increments starting with less than $5,000 annually up to $25,000 to $30,000 annually. The seventh and eighth increments were $30,000 to $40,000, and $40,000 to $50,000. The ninth group represents those households with incomes greater than $50,000.

The occupation of both the mother and father was categorized by the job classification scale shown in Table 1, which is a modification of a categorization system used by the United States Department of Labor. These data were obtained from the student surveys to reduce data collection costs, and because it was felt that high school students have knowledge of the type of job their parents have and the duties entailed, and are less likely to exaggerate the importance or quality of that job than are the parents. Data regarding the occupation of both parents was obtained. The actual value used in the analyses reflect the occupation of the parent in the highest rated occupation. Since the categorization of occupations is ordinal and not cardinal, a set of seven dummy variables (JOB1,...,JOB7) for the parents occupation was used, with the omitted category representing those students who do not live with an employed parent.

The mother's and father's education is defined as the number of years of formal schooling completed, as stated by the parent or parent's spouse. As with the parent's occupation, the number of years of formal education completed by the most educated parent was used in the empirical model ($EDUCATION_p$). Research has shown that children from one-parent families are socioeconomically disadvantaged compared to children in two-parent families (Bosman and Louwes, 1988). To reflect the differential effects of one- and two-parent families a dummy variable was set equal to one for those youths that reside in non-

two-parent families (ONE_PARENT).

The only personal characteristic measurement used in the study was the youth's gender, with a dummy variable set equal to one for those youths who are female (FEMALE). Mental ability is, of course, an important factor in explaining educational performance. Several previous studies have administered a brief IQ test during the interviews (Woelfel and Haller, 1971; Sewell and Hauser, 1972; Alexander, Eckland, and Griffin, 1975; Wilson and Portes, 1975). In the present research, administration of an IQ test would have increased the complexity and length of the survey, which were constraining factors. Other studies have used a self-concept measure, which is how the respondent feels they compare in ability with other students in the school (Bachman et al., 1969). However, the results tended to show that measures of self-concept are highly correlated with socioeconomic background. Finally, Coleman et al. (1966) claim that it is unclear whether IQ tests measure mental ability, and that they are culturally biased. For these reasons, and because no data on mental ability was available from the schools, a direct measure of mental ability was not used in this research.

Perception of Local Employment Opportunities. The provision of employment opportunities is a key element in the ability of rural communities to retain their most highly skilled workers. It also provides an incentive to those still in school to acquire the skills necessary to compete successfully for these jobs. However, individual perceptions differ regarding the constitution of "employment opportunities." Since it is not actual employment opportunities that influence decisions but perceptions of these opportunities, each individual was asked to state their subjective opinion about local job opportunities. Each student was asked to rate the statements "good jobs for high school graduates (college graduates) are hard to find around here." Their responses define the variables DIPLOMA_JOBS for jobs for high school graduates and DEGREE_JOBS for jobs for college graduates.

Community Influences. Nearly all research investigating the factors that influence school outcomes include some measure of the influence of the schools or community. Traditional studies of the influence of schools and the community have focussed on school input measures such as expenditures on education and student-teacher ratios. Hanushek (1989) summarized much of the research done on the relationship between various measures of school inputs and outputs, most of which used aggregated data. He found no strong or systematic relationship between expenditures on education and student performance. The present study uses desegregated data for only four school districts, and as such the traditional measures of schools are not relevant. Instead, a set of four dummy variables was used to represent differences in community influences (MONT_KY, WISE_VA, MONT_VA, and NORTON_VA).

The influence of the community may impact the attitudes of people in other ways. Individuals, in their daily contact with others in the community, may observe that more

educated individuals seem to enjoy a higher quality of life because of better access to health care and other goods and services due to their generally higher incomes (Smith, 1988, 1989). This may influence the attitudes that individuals in the community have toward education, and may provide motivation to students to put forth more effort in their academic endeavors. It is likely that the intensity of these community influences decreases as distance from the community increases. Families that live at some distance from the community core are likely to live in a more rural setting, and as such have less contact with others in the community, which may tend to weaken the influence of the community. To account for this relationship the research includes a variable for distance from the high school (DISTANCE). This variable was used because the high schools are generally located in or near towns or population centers, and because it is likely that individuals know approximately how far they live from the school. This variable is less meaningful in Montgomery County, Virginia because two of the communities are so large that individuals living as many as several miles from the school could still be considered as living in town.

Personal Attitudes. The inclusion of personal attitudes is designed to account for the relative attractiveness of the community of residence as compared to communities elsewhere. Consequently, measures of personal attitudes reflect both the willingness to relocate to obtain employment elsewhere and some measure of the quality of life locally, which would tend to cause individuals to want to stay in the local community. These two factors are closely linked, since the willingness to move is often determined by the perceived quality of life locally.

To account for these attitudes, the youths were surveyed regarding their willingness to move to a large city three hours away from home to get a job (3_HOURS_AWAY), and about their willingness to move to a large city outside of the south to get a job (OUT_OF_SOUTH)[2]. The youths were also asked to state whether children should try to live near their parents when the time comes for them to get a full-time job (LIVE_NEAR).

Valuation of Education. Obtaining accurate measures of the valuation of education is important because these measures serve as dependent variables in some equations and as independent variables in others. The youths and their parents were asked to respond to a series of statements about the value they place on education. One method of measuring one's valuation of education is in terms of the value it provides in preparing the individual

[2]The youths in Kentucky responded to a statement regarding whether they would be willing to move farther north than Kentucky or Virginia. The answers were treated the same as the measure of the willingness to move out of the south. However, there is no means in which to test whether these questions are significantly different from each other. If there is, then the difference may show up in the community influence dummy variable MONT_KY.

for certain occupations. The youths and parents were asked to rate three statements regarding the quality of jobs that generally require: 1) no high school diploma; 2) a high school diploma; and 3) a college degree. The response to the "no diploma" statement served as a base on which to determine the value placed on a high school diploma and college degree. The difference between having no diploma and having a high school diploma defines the value of a high school diploma (DIPLOMA_VALUEy and DIPLOMA_VALUEp) in terms of the quality of jobs it prepares one for. DEGREE_VALUEy and DEGREE_VALUEp represent the difference in the response of having a high school diploma and having a college degree of the youths and parents, respectively.

The youths and parents were also asked to respond to a statement regarding their willingness to accept taxation to support education (TAXESy and TAXESp). Specifically, the statement asked that "if the state government had a budget surplus I would rather everyone receive a tax refund than have the money spent on education." The responses were sequenced such that a higher number favored expenditures for education. Additionally, the youths and parents were asked if they felt that students should be required to pass a test on basic math and English to graduate (BASIC_TESTy and BASIC_TESTp). The parents responded to two additional statements, one regarding whether they believed that education helped people have a "better life" (BETTER_LIFEp), and whether children should be punished for skipping school (TRUANTp). Finally, the youths were asked how important they believed education to be (SCHOOL_IMPORTANCE)[3].

Educational Performance. The above factors were evaluated for their influence on cumulative high school grade point averages and scores on standardized achievement tests administered in the students' junior year. Data limitations prevented the use of these data for the dropout population. With regard to test scores, the students in Kentucky were administered the Iowa Test of Basic Skills (ITBS), while the Virginia students took the Science Research Associates (SRA) test. The tests were designed to measure the same abilities, yet the scores of the two tests are not comparable in their raw form, and no method exists to make them completely comparable. To approximate comparability the

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[3] A clerical error in survey construction for the Kentucky students caused the omission of this item. Although the students were requested to provide a response to the statement given verbally, the rate of non-response to the statement in Kentucky was 70.8%. The rate of non-response by the Virginia students to this question was a much lower 4.1%. It was decided to substitute the mean value for those with a missing value because the variable was considered important, and because the omission of observations with a missing variable would cause the results to seriously under-represent the Kentucky population. This action was taken with the understanding that substituting the mean value for all missing values limits the explanatory power as an independent variable.

scores were standardized within each state to a mean of 50 and a standard deviation of 10. The measure of GPA used was cumulative for the four years of high school.

Educational and Occupational Aspirations. To obtain a measure of the students' educational aspirations, each student was asked to state what they were most likely to do after they finished high school. Choices given were: try to get a job (GET_A_JOB); go to a trade school (TRADE_SCHOOL); join the armed forces (ARMED_FORCES); become a homemaker; go to a community college((TWO_YEAR); go to a community college and then transfer to a four-year college or university (TRANSFER); and go to a four-year college or university (FOUR_YEAR). Dummy variables were created for each category because the responses were not cardinal. Those students intending to become a homemaker were placed in the (GET_A_JOB) category because there were fewer responses in the category than there were explanatory variables. An additional dummy variable was created for the dropouts (DROPOUT). Each dummy variable then served as a dependent variable in a series of equations using logit analysis.

A similar approach was used to evaluate occupational aspirations. The respondents were asked to state the type of job they expected to have, considering the amount of education and experience they expect to have received, when they are 35 years old. The question was asked in an open-ended fashion rather than providing categorical response choices, which likely explains the high rate of non-response to this item (34 percent). The responses were then classified on the same scale as was used to classify the parents' occupation (Table 1). The responses were skewed toward the higher-skilled occupations, which necessitated combining classes to form large enough groups. Class one and two were combined to form JOB_LOW, classes three and four to form JOB_SEMI, and classes six and seven to form JOB_HIGH. Class five, which is self-employed, was not estimated because the group is small and because the diversity of occupational types of self-employed individuals may have characteristics of being in either of the three groups. Table 2 shows each of the variables used in the models and a brief description of each.

Youth's Valuation of Education Model

The dependent variables in the youth's valuation of education model were treated as being continuous, and were therefore estimated using ordinary least squares regression procedures. Since multiple dependent variables existed, these equations were estimated using a multivariate approach. The multivariate approach estimates each equation separately, but also provides for a significance test of the independent variables across equations, the Wilks' lambda[4].

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[4]The distribution of Wilks' lambda is asymptotic and approximated by a chi-squared distribution. For a technical discussion of Wilks' lambda see Morrison, 1976, p. 222.

The results of the youth's valuation of education model are shown in Table 3. Each of the five equations is significant as measured by the F statistic. With respect to the first hypothesis, of the six variables reflecting the parent's valuation of education only three are significant in any of the equations. BETTER_LIFEp is significant and positive in the SCHOOL_IMPORTANCEy equation, indicating that those youths who think education is important have parents with similar perceptions. The positive relationship between DIPLOMA_VALUEp and DEGREE_VALUEy indicates that parents who place a high value on a high school diploma have children who place a high value on a college degree. The negative coefficient on DEGREE_VALUEp in the BASIC_TESTy equation means that parents who place a high value on a college degree have children who feel that students should not have to pass a basic skills test to graduate. In terms of the hypothesis that parents' attitudes influence their children, these equations provide only weak evidence that this relationship exists.

The second hypothesis is that the willingness to move is positively related to the valuation of education. The willingness to move out of the south (OUT_OF_SOUTH) was positive in four of the five equations, but is significant only in the TAXESy equation. The willingness to move three hours away (3_HOURS_AWAY) was not significant in any of the equations, while LIVE_NEAR was significant and negative in the DIPLOMA_VALUEy equation, indicating a positive relationship between the willingness to move and the perceived value of a high school diploma. These results provide weak evidence that the valuation of education is influenced by one's willingness to move.

The perception of local job opportunities for high school graduates (DIPLOMA_JOBSy) is negative and significant in the BASIC_TESTy and DEGREE_VALUEy equations, and positive and significant in the DIPLOMA_VALUEy equation. The multivariate test indicates that DIPLOMA_JOBSy is significant across equations. The negative influence of DIPLOMA-JOBSy on DEGREE_VALUEy indicates that a lack of local job opportunities causes youths to place a higher value on a college degree, which is consistent with the general hypothesis presented earlier. These findings tend to support the hypothesis that perceptions of local employment opportunities influence the value that youths place on education.

With regard to the socioeconomic variables, household income (INCOME) is positive and significant in two equations, while parents' education (EDUCATIONp) is significant and positive in only one. The Wilks' multivariate test indicates that both EDUCATIONp and FEMALE are significant across equations. Five of the parents' occupation variables (JOB1,...,JOB7) are significant in the BASIC_TESTy equation and the coefficients are positive in all seven equations. The coefficient on the professional occupation class (JOB7) is positive and significant in the TAXESy equation, while JOB2, JOB4, and JOB7 are positive and significant in the DEGREE_VALUEy equation. These findings indicate that students in families in which the parent has a higher level occupation place a higher value on a college degree.

Estimation of the Academic Achievement Model

The results of the ordinary least squares regression analysis of test scores and grade point average are shown in Table 4. Three of the five valuation of education variables are significant in at least one of the equations, and in each case exhibit the expected sign on the coefficient. Support for a basic skills test to graduate (BASIC_TESTy) has a positive and statistically significant influence on educational performance, while SCHOOL_IMPORTANCEy is positive in both equations and significant in the GPA equation. The coefficients on TAXESy are not consistent and neither is significant. The perceived value of a high school diploma is positive in the test score equation and negative in the GPA equation, with neither coefficient being significant. The value of a college degree is positive and significant in both equations. These findings provide support for the hypothesis that those individuals who place a higher value on education perform better in school.

In the TEST_SCORE equation, four of the seven parent's occupation variables are significant and positive with respect to the omitted variable of the parent being not employed. Moreover, there is a general increase in the size of the coefficients as movement occurs up the occupational scale, indicating that the higher the parent's occupational group, the higher the test score. The same progression occurs in the GPA equation, although significance levels are lower. The parent's education (EDUCATIONp) is a positive influence on achievement in both equations, while living in a one-parent family has a negative influence on achievement. Household income is not significant in either equation, probably because the occupational variables are included. Gender of the student is significant in the GPA equation, but not in the TEST_SCORE equation. These findings indicate that test scores and GPA are related to socioeconomic background and gender.

The negative coefficient and statistical significance of MONT_VA in the TEST_SCORE equation indicates that students in Montgomery County, Virginia perform less well on standardized tests than students in the other three districts after controlling for the other factors. This would suggest that the differences between the communities have been reflected in the attitude and perception variables.

Estimation of the Educational and Occupational Aspirations Models

The dependent variables in the educational and occupational aspirations are dummy variables and, therefore, estimation with ordinary least squares is inappropriate. The logit model is a maximum likelihood function that uses nonlinear estimation techniques to maximize the likelihood function. One drawback of the logit model is that no conventional measure of R-square exists (Madalla, 1983, 1988). Madalla (1988) suggests the use of a measure of goodness-of-fit based on the proportion of correct predictions. The measure suggested by Madalla is the count R-square:

(15) $$\text{Count } R^2 = \frac{\text{number of correct predictions}}{\text{total number of observations}}$$

The minimum value for the traditional measure of R-square is zero. However, for count R-square, if the distribution of values was completely random, its predicted value would be the sum of the squared number of observations with the dependent variable being one, and the squared number of observations with the dependent variable being zero. Simple calculations show that the minimum value of count R-square, which occurs when one-half of the observations are equal to one for a random distribution is .50. Hence, count R-square should not be compared to the traditional measure of R-square.

To account for this problem the following procedure was used. First, a baseline count R-square was calculated to correspond to a completely random distribution of the dependent variable. Next, the Madalla measure was calculated based upon the results of the equations. Finally, the difference between these two measures was calculated to provide an indication of the improvement in the number of correct predictions that can be attributed to the model.

Educational Aspirations Model

Each of the valuation of education variables are significant in at least four of the seven equations explaining the variation in post-high school plans (Table 5). Requiring passage of a competency test to graduate (BASIC_TESTy) is positive and significant in the DROPOUT and FOUR_YEAR equations. The positive coefficient on BASIC_TESTy in the DROPOUT equation indicates that dropouts view education as an important learning activity, but for some reason chose not to continue their education. Perhaps the dropouts, having been out of school for up to four years, found it difficult to obtain good jobs, and believed that more education would have helped them obtain better jobs. For those either getting a job, going to trade school, or attending a two-year college, the negative coefficient on BASIC_TESTy indicates that the diploma may be regarded as a reward for having "put in the time."[5] Willingness to accept taxation to support education (TAXESy) is negative and significant in both the DROPOUT and TRADE_SCHOOL equations, and positive and significant in the TWO_YEAR and FOUR_YEAR equations. This finding shows a strong relationship between the willingness to pay for education and educational aspirations.

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[5]Post-high school vocational training is handled differently in Virginia than in Kentucky. In Virginia the community college system provides vocational training while in Kentucky this function is performed by a system of state run vocational schools. Consequently, the student body at community colleges in Virginia is likely to exhibit characteristics of the TRADE group, the TWO_YEAR group, and the TRANSFER group.

DIPLOMA_VALUEy is negative in the dropout equation and positive and significant in the TRADE, TRANSFER, and FOUR_YEAR equations, indicating that those with higher aspirations place a higher value on a high school diploma. DEGREE_VALUEy behaves as expected, being negative in the DROPOUT, GET_A_JOB, and TWO_YEAR equations, and positive in the TRANSFER and FOUR_YEAR equations. These findings are consistent with the hypothesis that those with more positive attitudes toward education will exhibit higher educational aspirations.

The socioeconomic variables behave generally as expected. The coefficients on EDUCATIONp and INCOME tend to increase with increasing aspirations. At the extremes, the coefficients of the parent's occupation variables tend to decrease with increasingly higher occupational class for the dropouts and increase for those planning to attend a four-year college or university. Each of the three community variables is significant in at least one equation, with MONT_VA being significant in all seven.

The goodness-of-fit measures indicate that an improvement over a random generation occurs in each equation. A high value for "proportion correct random" indicates that a low proportion of the youths are included in that group. Hence, those groups with fewer individuals have less room for improvement. However, those groups with a higher number of individuals have more data points on which to establish a statistically significant relationship with the independent variables. Considering these factors, it appears that each of the equations is significant in explaining the variation in the level of educational aspirations.

Occupational Aspirations Model

Table 6 shows the results of the occupational aspirations equations. It should be noted that this item on the survey suffered from a low response rate of 34 percent, which likely influences the findings. Further, the number of individuals in the JOB_LOW category represented 12.3 percent of the respondents, while JOB_SEMI represented 19.6 percent. A majority, 61.8 percent, of the respondents were in the JOB_HIGH group.[6] A wider dispersion among the three groups would likely have provided stronger results.

In the JOB_HIGH equation three of the valuation of education variables are positive and significant, indicating a positive relationship between occupational aspirations and the perceived value of education. In the JOB_SEMI equation, DIPLOMA_VALUEy is positive and significant, while DEGREE_VALUEy is negative and significant. Apparently those aspiring to semi-skilled jobs or trade occupations value a high school diploma but not a college degree. This result is consistent with the general hypothesis of this research, since a college degree is not generally required for occupations in this group, while a diploma

[6] The remaining 6.3 percent are in the self-employed category.

generally is required. In the JOB_LOW equation the valuation of education variables are all negative and three of the four are statistically significant. This result is also consistent with the general hypothesis, since those with low occupational aspirations generally place a low value on education.

The results of the influence of the socioeconomic variables on occupational aspirations appear to influence aspirations as well. EDUCATIONp is negative and significant in the JOB_LOW and JOB_SEMI equations, and positive and significant in the JOB_HIGH equation, indicating that youths with more educated parents tend to have higher aspirations. The parent's occupation variables are positive and significant in the JOB_LOW equation. Since the highest occupation group, JOB7, is the reference or comparison group, the coefficients on JOB1 through JOB6 indicate that parents in lower occupations are highly correlated with low occupational aspirations among their children. Likewise, the negative coefficients on JOB1 through JOB6 in JOB_HIGH indicate a reduced tendency for students whose parents are in lower occupational groups to aspire to higher occupations. None of the community variables are significant in any of the equations. Taken together, these findings indicate that a strong positive relationship exists between the perception of the value of education and occupational aspirations, and socioeconomic background and aspirations.

Conclusions and Implications

The purpose of this research has been to examine the incentive structures that exist in Appalachia that influence the acquisition of marketable skills. While this study is only a case study, it does provide useful insights and provisional tests of the hypotheses. The empirical results support the hypothesis that local job opportunities influence the value that youths place on education. Weaker support is provided for the hypothesis that one's willingness to leave the local community to obtain employment, the value that one's parents place on education, and family socioeconomic conditions influence the value that individuals place on education. The results also show that the value that youths place on education and socioeconomic background influence educational performance and educational and occupational aspirations.

One aspect of the present study that sets it apart from prior research is that it relied on primary data collected from both youths and their parents, which allows for an analysis of the intergenerational transfer of attitudes and perceptions about education. Nearly all previous studies relied on aggregate data, and therefore, the results of this research are not directly comparable to previous studies. In addition, the research included both high school students and dropouts, the latter being somewhat neglected in the literature due, in part, to the expense and effort required to make contact and obtain completed surveys.

This study has examined how the attitudes and perceptions of individuals influence the acquisition of human capital. Otto (1986) argues that the primary way in which attitudes

are formed is through the family. This research confirms previous research that found that family socioeconomic background is an important factor in explaining educational performance and aspirations. This conclusion would suggest that to improve educational performance and perhaps break the cycle of poverty, it may be necessary to improve socioeconomic conditions in the home to realize improvements in educational performance. However, this research has also shown that the perceived value of education has an important influence on educational performance and aspirations as well, and that these perceptions are related to non-familial variables. Coleman's (1988) argument that the community can offset family influences supports this conclusion. Thus, it may be advisable to focus efforts on directly changing individuals' attitudes and perceptions regarding education. Perhaps the widespread availability of television in even the most remote areas, and the rising amount of time spent watching television, provides a useful means to persuade young people and parents through the media that education is important. It may be more effective and certainly less costly to change attitudes in this manner than to improve socioeconomic conditions in the home.

From the perspective of local economic development, these findings suggest that a variety of local economic factors influence educational performance, which impacts the future quality of the local labor force. The results also support the general hypothesis that those students with the greatest ability are more likely to seek employment elsewhere if good jobs are not available locally. These findings, thus, underscore the importance of maintaining a high quality of life in rural communities. Improving the health of the local economy by attracting and supporting high quality employers whenever possible while simultaneously improving local public services, especially education, improves the quality of life in the community. Improvements in educational services provide two types of benefits: they improve the attractiveness of the community because management personnel prefer to live in communities that offer high quality education for their children, and they improve the quality of the work force, which increases aggregate productivity. These efforts would create incentives for high-quality employers to remain in the community, and in this way could eventually slow the outflow of higher-skilled workers. Further, the establishment of higher quality employers in the community and improvements in the quality of life may also cause a reverse migration of more highly skilled workers who left previously but would prefer to return. Most importantly, however, higher quality employers will encourage improved educational performance among students, especially those anxious to stay in the community. In short, a dual commitment to improve educational performance and attract high quality jobs may lead to a reversal in the spiral of declining economic opportunity in some rural communities.

Individual behavior is a result of a complex set of factors. Economic behavior, including decisions regarding the quantity and quality of education one desires, is influenced, in part, by economic and social conditions in the local community. Within the local community there exists a set of incentives that act to encourage or discourage individuals from acquiring human capital to maximize utility. Given the long-term nature of human capital investments, the perception of the returns to education in communities experiencing

economic decline are likely to be lower than in communities experiencing economic growth and prosperity due to uncertainty. It is important that policy makers realize not only that these incentive structures exist, but that they understand how private and public actions affect these incentives.

While the influence of the local community is likely less important for the more mobile individuals in the community, those who have strong preferences for remaining in the community face a discouraging opportunity set. This opportunity set is more likely to include substandard housing, lower lifetime earnings, lower quality health care, and less certainty with regard to employment. Those who choose to remain in the community are not necessarily disadvantaged because they lack values or attitudes that those in more prosperous communities possess, but because they have strong locational preferences that prevent relocation to more prosperous communities. It is for society to decide if the cost of locational preference is to be continuing economic and social decline, or whether policies should be developed that provide reasonable alternatives to poverty and disenchantment in such rural communities.

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Figure 1.

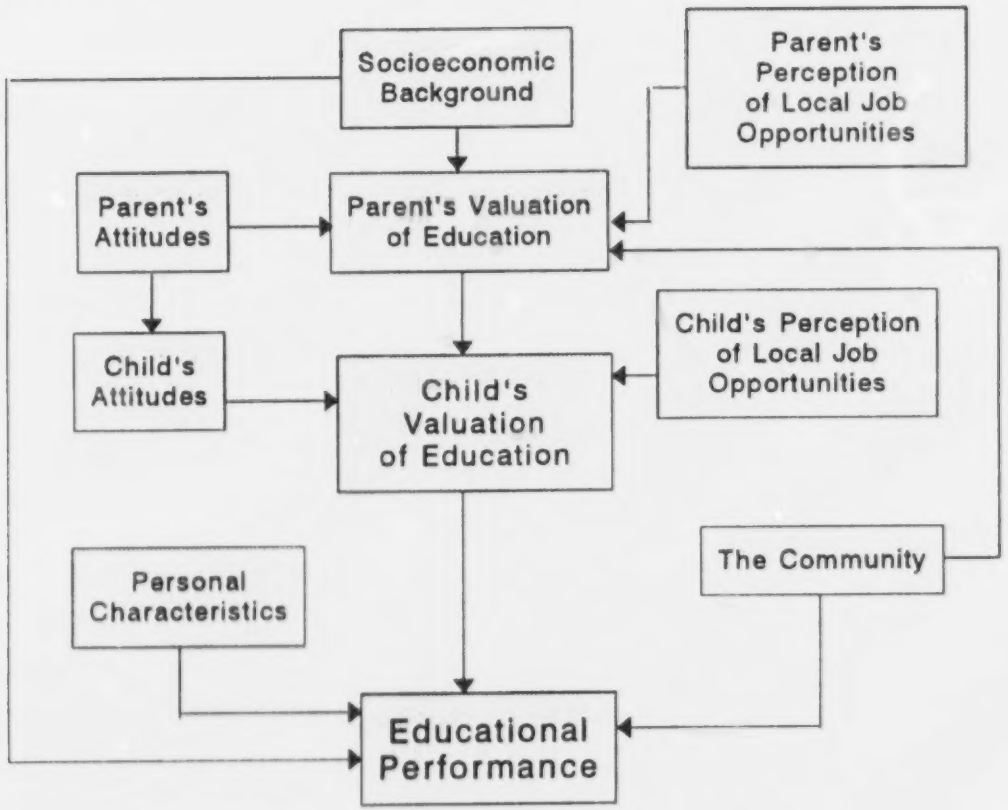
Socioeconomic Background
Parent's Perception of Local Job Opportunities
Parent's Attitudes
Parent's Valuation of Education
Child's Attitudes
Child's Perception of Local Job Opportunities
Child's Valuation of Education
Personal Characteristics
The Community
Educational Performance

Table 1: Description of Employment Categories by Class.

Class	Description
One	Production, farm, mining, transportation, and non-clerical service workers (including self-employed production, transportation, and non-clerical service workers).
Two	Clerical (including self-employed clerical) and retail sales workers.
Three	Foremen and managers of production, farm, transportation, mining, clerical, and non-clerical service workers.
Four	Tradesmen and para-professional aides.
Five	Self-employed non-professionals, farm owner-operators, small business owners and managers (except self-employed clerical and non-clerical service, production, and transportation workers).
Six	Technical, para-professional, non-clerical sales workers, managers of tradesmen, middle managers, contractors.
Seven	Professional, administrative, managers of technical and para-professional workers.

Table 2: Description of Variables Used in the Statistical Analysis.

Variable Name	Description
Socioeconomic Background:	
ONE_PARENT	Dummy variable for youth residing in a non-two parent family.
EDUCATIONp	Number of years of school completed by the parent with the greatest number of years of formal education.
INCOME	Parent's household income.
JOB1,...JOB7	Occupation of the parent with the highest rated occupation classified in seven occupation categories.
Gender:	
FEMALE	Dummy variable for the youth being female.
Community:	
MONT_KY	Dummy variable for residing in Montgomery County, Kentucky.
WISE_VA	Dummy variable for residing in Wise County, Virginia.
MONT_VA	Dummy variable for residing in Montgomery County, Virginia.
NORTON_VA*	Dummy variable for residing in Norton, Virginia.
DISTANCE	Distance in miles to the youth's school.
Youth's Willingness to Move:	
LIVE_NEAR	Belief that children should try to live near their parents after completion of education.
3_HOURS_AWAY	Youth's willingness to move to a large city three hours away from home to get a job.
OUT_OF_SOUTH	Youth's willingness to move to a large city outside the South to get a job.

Perception of Local Employment Opportunities:

DIPLOMA_JOBS	Youth's perception of local employment opportunities for jobs which generally require a high school diploma.
DEGREE_JOBS	Youth's perception of local employment opportunities for jobs which generally require a high school diploma.

Valuation of Education:

BASIC_TESTy BASIC_TESTp	Support for requiring students to pass a basic skills test to graduate from high school.
TAXESy, TAXESp	Preference for increasing expenditures for education.
TRUANTp	Parent's belief that children should be punished for skipping school.
DIPLOMA_VALUEp DIPLOMA_VALUEy	Perception of the value of a high school diploma in accessing higher quality employment opportunities.
DEGREE_VALUEy DEGREE_VALUEp	Perception of the value of a college degree in accessing higher quality employment opportunities.
BETTER_LIFEp	Parent's belief that education helps people have a better life.
SCHOOL_ IMPORTANCEy	Youth's perception of the importance of education.

Educational Performance:

GPA	Youth's cumulative high school grade point average.
TEST_SCORE	Youth's performance on 11th grade standardized academic achievement test.

Educational Aspirations:

DROPOUT	The youth is a high school dropout.
GET_A_JOB	The youth plans to get a job or become a homemaker after completion of high school.
TRADE_SCHOOL	The youth plans to enter a trade or vocational school after completion of high school.

ARMED_FORCES	The youth plans to join the armed forces after completion of high school.
TWO_YEAR	The youth plans to go to a two-year college after completion of high school.
TRANSFER	The youth plans to go to a two-year college, then transfer to a four-year college or university, after completion of high school.
FOUR_YEAR	The youth plans to go to a four-year college or university after completion of high school.

Occupational Aspirations:

JOB_LOW	The youth expects to have a low-skilled job at age 35.
JOB_SEMI	The youth expects to have a semi-skilled job at age 35.
JOB_HIGH	The youth expects to have a high-skilled job at age 35.

*Variable deleted in statistical analysis to prevent perfect collinearity.

Table 3: Regression Results of Youth's Valuation of Education.

Independent Variables	BASIC_ TESTy	TAXESy	SCHOOL_ IMPORTANCEy	DIPLOMA_ VALUEy	DEGREE_ VALUEy	Wilks' Lambda F-Value
Intercept	3.6238 * (1.0244)	2.9114 * (0.9607)	2.2047 * (0.6773)	2.0369 ** (0.8874)	0.2771 (0.7203)	-
Parent's Valuation of Education:						
BASIC_TESTp	-0.0263 (0.0808)	0.0521 (0.0758)	-0.0540 (0.0534)	0.0204 (0.0700)	-0.0917 (0.0568)	2.6089
TAXESp	0.0064 (0.0553)	0.0478 (0.0519)	-0.0516 (0.0366)	-0.0156 (0.0479)	0.0144 (0.0389)	0.1378
TRUANTp	0.0443 (0.0901)	0.0539 (0.0845)	-0.0487 (0.0596)	0.0676 (0.0781)	0.0853 (0.0634)	1.8128
BETTER_LIFEp	-0.0473 (0.2074)	0.0511 (0.1945)	0.5412 * (0.1371)	-0.0777 (0.1797)	-0.1022 (0.1458)	0.4914
DIPLOMA_VALUEp	-0.0090 (0.0539)	0.0696 (0.0506)	0.0275 (0.0357)	0.0521 (0.0467)	0.0667 *** (0.0379)	3.0970 ***
DEGREE_VALUEp	-0.1213 ** (0.0615)	0.0170 (0.0576)	-0.0178 (0.0406)	-0.0122 (0.0532)	0.0430 (0.0432)	0.9901
Willingness to Move:						
3_HOURS_AWAY	0.0645 (0.0555)	0.0114 (0.0521)	0.0099 (0.0367)	0.0443 (0.0481)	0.0269 (0.0390)	0.4763
OUT_OF_SOUTH	0.0541 (0.0511)	0.0800 *** (0.0480)	0.0476 (0.0338)	-0.0145 (0.0443)	0.0272 (0.0360)	0.5725
LIVE_NEAR	-0.0315 (0.0579)	0.0191 (0.0543)	0.0422 (0.0383)	-0.1638 * (0.0502)	0.0097 (0.0407)	0.0568
Youth's Perception of Local Employment Opportunities:						
DIPLOMA_JOBS	-0.1559 * (0.0585)	0.0693 (0.0549)	-0.0327 (0.0387)	0.0697 ** (0.0507)	-0.0684 *** (0.0412)	2.7593 ***
DEGREE_JOBS	-0.0526 (0.0546)	0.0247 (0.0512)	0.0100 (0.0361)	-0.0224 (0.0473)	0.0072 (0.0384)	0.0351
Socioeconomic Background:						
ONE_PARENT	0.2187 (0.1635)	0.1009 (0.1534)	0.1621 (0.1081)	-0.0031 (0.1417)	0.1256 (0.1150)	1.1925
INCOME	0.0692 ** (0.0295)	0.0540 *** (0.0276)	0.0162 (0.0195)	-0.0332 (0.0255)	0.0297 (0.0207)	2.0556
EDUCATIONp	-0.0211 (0.0247)	-0.0381 (0.0231)	-0.0003 (0.0163)	-0.0310 (0.0214)	0.0449 * (0.0174)	6.6982 *
JOB1	0.2312 (0.2304)	-0.2774 (0.2161)	-0.0538 (0.1524)	-0.2370 (0.1996)	0.1890 (0.1620)	1.3602
JOB2	0.5657 ** (0.2784)	-0.1895 (0.2611)	-0.0179 (0.1841)	0.1155 (0.2412)	0.3288 *** (0.1958)	2.8216 ***
JOB3	0.3555 (0.2956)	0.0337 (0.2772)	0.0213 (0.1954)	0.1170 (0.2561)	0.2791 (0.2079)	1.8025

JOB4	0.4196 ***	-0.0776	0.0826	-0.0035	0.3549 **	4.5271 **
	(0.2372)	(0.2224)	(0.1568)	(0.2055)	(0.1668)	
JOB5	0.6858 **	0.0630	-0.0225	0.0469	0.3023	2.2027
	(0.2897)	(0.2717)	(0.1915)	(0.2510)	(0.2037)	
JOB6	0.5780 **	-0.0210	-0.0039	-0.0048	0.2826	2.5994
	(0.2492)	(0.2338)	(0.1648)	(0.2159)	(0.1753)	
JOB7	0.8203 **	0.6883 **	0.1499	-0.0486	0.7028 *	9.0645 *
	(0.3320)	(0.3114)	(0.2195)	(0.2876)	(0.2334)	
Gender:						
FEMALE	-0.0604	0.4808 *	0.2261 *	0.0633	0.1781 **	5.0997 **
	(0.1122)	(0.1052)	(0.0742)	(0.0972)	(0.0789)	
Community:						
DISTANCE	-0.0121	-0.0265 ***	0.0061	0.0173	0.0028	0.0597
	(0.0164)	(0.0154)	(0.0108)	(0.0142)	(0.0115)	
MONT_KY	-0.2910	-0.0984	0.0320	0.1607	-0.2238	1.1047
	(0.3029)	(0.2841)	(0.2003)	(0.2624)	(0.2130)	
WISE_VA	-0.0422	-0.1379	0.0708	0.4135 ***	-0.0434	0.0464
	(0.2866)	(0.2688)	(0.1895)	(0.2483)	(0.2015)	
MONT_VA	0.2303	-0.1002	-0.0387	0.2863	-0.3223	2.4351
	(0.2937)	(0.2755)	(0.1942)	(0.2545)	(0.2065)	
R-square	0.0940	0.1256	0.0907	0.0772	0.1449	
Adj. R-square	0.0468	0.0800	0.0433	0.0292	0.1003	
F-Value	1.9920 *	2.7570 *	1.9140 *	1.6070 **	3.2520 *	
Number of Observations	526	526	526	526	526	

Values in parentheses are standard errors.
* Significant at the 1% level of probabilty.
** Significant at the 5% level of probabilty.
*** Significant at the 10% level of probabilty.

Table 4: Regression Results of the Youth's Academic Achievement Model.

Variable	TEST_SCORE	GPA
Intercept	26.0313 *	0.5997 **
	(4.0754)	(0.2699)
Youth's Valuation of Education:		
BASIC_TESTy	1.2740 *	0.0685 *
	(0.3239)	(0.0220)
TAXESy	0.5243	0.0019
	(0.3558)	(0.0239)
DIPLOMA_VALUEy	0.2131	-0.0019
	(0.3791)	(0.0257)
DEGREE_VALUEy	2.7341 *	0.1560 *
	(0.4594)	(0.0319)
SCHOOL_IMPORTANCEy	0.4562	0.1747 *
	(0.5670)	(0.0373)
Socioeconomic Background:		
ONE_PARENT	-2.0888 ***	-0.0563
	(1.1992)	(0.0804)
INCOME	0.1309	-0.0014
	(0.2104)	(0.0136)
EDUCATIONp	0.7023 *	0.0354 *
	(0.1828)	(0.0122)
JOB1	1.0390	-0.0361
	(1.7696)	(0.1136)
JOB2	2.9368	-0.0197
	(2.0449)	(0.1347)
JOB3	1.1723	-0.2077
	(2.1642)	(0.1433)
JOB4	3.4252 ***	0.0289
	(1.8106)	(0.1166)
JOB5	4.6121 **	0.0757
	(2.1070)	(0.1362)
JOB6	4.6143 **	0.1585
	(1.9384)	(0.1248)
JOB7	7.5091 *	0.2994 ***
	(2.5139)	(0.1652)
Gender:		
FEMALE	0.0115	0.2996 *
	(0.7743)	(0.0522)
Community:		
MONT_KY	1.2525	0.3134 **
	(2.0743)	(0.1437)
WISE_VA	-1.2217	0.1535
	(1.9904)	(0.1370)
MONT_VA	-3.5918 ***	0.1983
	(2.0090)	(0.1385)
R-square	0.3599	0.3264
Adj. R-square	0.3329	0.3004
F-Value	13.344 *	12.547 *
# of Observations	471	512

Figures in parentheses are standard errors.
* Significant at the 1% level of probability.
** Significant at the 5% level of probability.
*** Significant at the 10% level of probability.

Table 5: Logit Results of the Youths' Educational Aspirations.

Independent Variables	DROPOUT	GET_ _A_JOB	TRADE_ SCHOOL	ARMED_ FORCES	TWO_ YEAR	TRANSFER	FOUR_ YEAR
Intercept	-0.3084 (0.8375)	2.1441 * (0.6021)	-3.9021 ** (1.6179)	-3.1566 * (1.1209)	-2.9844 * (0.7412)	-6.3663 * (1.0101)	-5.9042 * (0.7076)
Valuation of Education:							
BASIC_TESTy	0.7045 * (0.0953)	-0.3637 * (0.0522)	-0.5557 * (0.1131)	0.1143 (0.0852)	-0.3388 * (0.0754)	0.0420 (0.0714)	0.1884 * (0.0571)
TAXESy	-0.3627 * (0.0753)	-0.0233 (0.0575)	-0.4482 * (0.1349)	0.1203 (0.0839)	0.1843 ** (0.0869)	0.1095 (0.0733)	0.1538 ** (0.0598)
DIPLOMA_ VALUEy	-0.6468 * (0.0842)	0.0663 (0.0606)	0.2486 ** (0.1393)	0.0190 (0.1022)	-0.0130 (0.0829)	0.2431 * (0.0846)	0.2461 * (0.0700)
DEGREE_ VALUEy	-0.5741 * (0.1098)	-0.4312 * (0.0847)	0.0477 (0.2096)	0.0329 (0.1370)	-0.3599 * (0.1124)	0.4146 * (0.1059)	0.7295 * (0.0883)
Socioeconomic Background:							
ONE_PARENT	0.9631 * (0.2404)	-0.4406 ** (0.2061)	0.8047 *** (0.4773)	-0.2647 (0.3162)	0.4147 (0.2603)	0.6736 * (0.2255)	-0.7691 * (0.2213)
EDUCATIONp	-0.2373 * (0.0374)	-0.1043 * (0.0295)	-0.0391 (0.0871)	0.00005 (0.0478)	-0.1215 * (0.0441)	0.0597 ** (0.0355)	0.2214 * (0.0319)
INCOME	-0.0251 (0.0457)	-0.0736 ** (0.0345)	0.1440 *** (0.0873)	-0.2064 * (0.0520)	0.1463 * (0.0499)	-0.0318 (0.0414)	0.0927 * (0.0351)
JOB1	1.0567 * (0.3551)	0.3167 (0.2804)	1.1360 (0.8433)	2.3493 * (0.7450)	-0.2991 (0.4687)	0.1449 (0.4529)	-0.0110 (0.4408)
JOB2	0.6406 (0.4130)	0.1735 (0.3394)	2.0997 ** (0.8967)	1.8564 ** (0.8172)	0.8385 *** (0.4930)	0.1403 (0.4865)	0.1777 (0.4611)
JOB3	0.2967 (0.4542)	0.7253 ** (0.3351)	1.1949 (1.0938)	2.3573 * (0.7940)	0.1711 (0.5534)	0.7845 (0.5007)	-0.3574 (0.4990)
JOB4	0.1639 (0.3704)	0.3240 (0.2859)	3.0986 * (0.7521)	2.0515 * (0.7584)	0.2861 (0.4793)	0.5775 (0.4549)	-0.0636 (0.4465)
JOB5	-0.1253 (0.4320)	0.2048 (0.3495)	a	2.3194 * (0.8002)	-0.0122 (0.5947)	1.4685 * (0.4860)	0.5113 (0.4681)
JOB6	-0.5738 (0.4213)	0.2141 (0.3075)	0.5128 (1.0683)	2.0535 * (0.7610)	0.4037 (0.5190)	0.8647 ** (0.4710)	0.3106 (0.4450)
JOB7	a	a	a	a	-1.3182 (0.9553)	-1.3529 ** (0.6792)	2.6716 * (0.5883)
Gender:							
FEMALE	0.2694 (0.1935)	0.0534 (0.1391)	-1.6139 * (0.4248)	-2.2975 * (0.3310)	0.8896 * (0.1907)	0.0877 (0.1679)	0.0468 (0.1381)
Community:							
MONT_KY	-0.8565 (0.5700)	0.0629 (0.3564)	2.6382 * (0.5252)	-0.3503 (0.4572)	a	-1.3578 (1.0083)	-0.1186 (0.3356)
WISE_VA	-0.2614 (0.5097)	-0.3163 (0.3437)	a	-0.4725 (0.4375)	2.3590 * (0.3859)	2.0152 * (0.7373)	-1.1228 * (0.3203)

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MONT_VA	1.7409 * (0.4987)	-0.6613 *** (0.3488)	1.3705 * (0.5276)	-1.2853 * (0.4561)	1.3535 * (0.4008)	1.8[illegible] ** (0.7[illegible])	-1.5513 * (0.3292)
Prop. correct random	0.7945	0.6670	0.9277	0.8550	0.8255	0.8000	0.5479
Prop. correct model	0.9460	0.9406	0.9874	1.0000	0.9928	1.0000	0.7352
Improvement	0.1515	0.2736	0.0597	0.1450	0.1673	0.2000	0.1873
Number of Observations	556	556	555	556	556	556	556

Values in parentheses are standard errors.
* Significant at the 1% level of probability.
** Significant at the 5% level of probability.
*** Significant at the 10% level of probability.
a Variable deleted to prevent perfect colinearity.

Table 6: Logit Results of the Occupational Aspirations Model.

Independent Variables	JOB_LOW	JOB_SEMI	JOB_HIGH
Intercept	0.7697 (0.9592)	0.6851 (0.9000)	-4.4887 * (0.6984)
Valuation of Education:			
BASIC_TESTy	-0.0763 (0.0809)	0.0289 (0.0729)	-0.0003 (0.0613)
TAXESy	-0.3354 * (0.0867)	-0.0481 (0.0729)	0.1363 ** (0.0629)
DIPLOMA_VALUEy	-0.4472 * (0.0981)	0.2505 * (0.0863)	0.1864 * (0.0708)
DEGREE_VALUEy	-0.3811 * (0.1285)	-0.4472 * (0.1262)	0.5735 * (0.0990)
Socioeconomic Background:			
ONE_PARENT	-0.3642 (0.2914)	0.3213 (0.2596)	-0.0721 (0.2095)
EDUCATIONp	-0.1560 * (0.0496)	-0.2058 * (0.0426)	0.2848 * (0.0356)
INCOME	-0.0482 (0.0530)	0.0573 (0.0464)	0.0196 (0.0377)
JOB1	1.9847 * (0.5263)	1.4650 * (0.4224)	-1.1233 * (0.2996)
JOB2	2.6152 * (0.5603)	-0.0134 (0.5358)	-0.4991 (0.3465)
JOB3	1.3172 ** (0.6233)	1.2937 * (0.4663)	-0.8240 ** (0.3469)
JOB4	1.4020 * (0.5434)	1.3383 * (0.4231)	-0.4917 (0.3003)
JOB5	a (0.6710)	-1.2198 *** (0.3782)	0.1650
JOB6	1.9150 * (0.5628)	0.8732 ** (0.4395)	-0.6521 ** (0.3124)
Gender:			
FEMALE	1.0512 * (0.2149)	-1.4704 * (0.1990)	0.5928 * (0.1490)
Community:			
MONT_KY	-0.3307 (0.5061)	-0.3348 (0.4700)	0.1138 (0.3837)
WISE_VA	-0.1379 (0.4608)	-0.6391 (0.4383)	0.3675 (0.3687)
MONT_VA	-0.0582 (0.4812)	0.0731 (0.4460)	-0.3675 (0.3687)
Proportion			

correct random	0.7847	0.6850	0.5270
Proportion correct model	0.9764	0.9055	0.6850
Improvement	0.1917	0.2205	0.1580
Number of Observations	381	381	381

Values in parentheses are standard errors.
* Significant at the 1% level of probability.
** Significant at the 5% level of probability.
*** Significant at the 10% level of probability.
a Variable deleted to prevent perfect colinearity.

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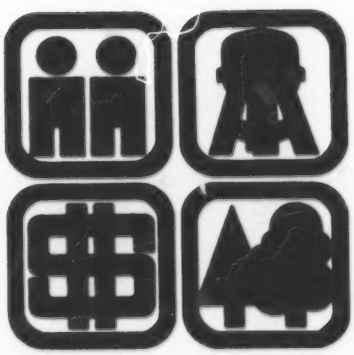

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